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GENTES HERBARUM

Occasional Papers on the Kinds of Plants

By L. H. Bailey

Certain Palms of the Greater Antilles—I

7. Calyptrogyne-Calyptronoma
8. Bactris group
9. Reported Copernicia in Jamaica

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86. TREE OF HISPANIOLAN MANAC, now to be named a new species in a reconstituted genus, heretofore referred to Calyptrogyne. Note the abundant fall of old leaves on the ground, and the hanging clusters. Page 169.

The use of the dagger (†) against some of the entries in the text is to indicate new binomials for convenience of the bibliographer.

ARTICLE 7. THE CALYPTROGYNE-CALYPTRONOMA PROBLEM — THE MANAC PALMS.

We are now to attack a group of palms native in the Greater Antilles, commonly considered to be a single species and called *Calyptrogyne occidentalis*, but which we shall learn comprises apparently four species; and we shall discover reasons for separating the set into a genus of its own, and shall be obliged to reconstruct the nomenclature.

We may begin the exploration with the palm in Jamaica known to botanists as Calyptrogyne and to the people there as "long thatch." It grows in extensive stands in marshes and deep morasses not far from the sea, often in water several feet deep, standing perhaps 20 or 25 feet tall at maturity. I have seen much of it in the Black River country in St. Elizabeth, also at Negril on the western end of the island, as well as elsewhere.

As early as 1797 Olof Swartz, as we have learned in the Thrinax paper, published on the palms of Jamaica,—*Thrinax parviflora*, *Cocos fusiformis* now known as Acrocomia, and *Elais occidentalis* with the species placed doubtfully in the genus. We have invariably supposed, since Grisebach, that Swartz meant only the long thatch by his doubtful Elais, but this is difficult to establish because his description is not sufficient and we have no specimens for verification. He records a palm 50 to 60 feet tall growing in mountain valleys ("*in depressis montium*") in the interior of Jamaica. He speaks of inadequate material because the palm was destroyed by the terrible hurricane of 1785, the year of his second visit. One who knows Jamaica is likely to think at once of the mountain cabbage palm, now known as *Roystonea jamaicana*, which is also one of the thatch palms of the island; and we should naturally expect that in a list of three indigenous palms on Jamaica the mountain cabbage would be included. It is interesting to note the coincidence in habitat when *R. jamaicana* was described in recent years: "type localities . . . are in interior valleys"; stature 20 meters or less. Yet Swartz describes the spadix of long thatch as well as the flowers imperfectly. It is probable he confused two palms.

Inasmuch as we have a good old binomial for the Jamaica long thatch and as the combination *Calyptrogyne occidentalis* was made for a Cuban palm (to which it does not belong) I am inclined to treat Swartz's ?*Elais occidentalis* as a *nomen incertum* and not try to make further application of it. We may the easier rid ourselves of traditional notions if we keep the record clear.

In 1859 Wendland separated a Nicaraguan and a southern Mexican Geonoma into a new genus, Calyptrogyne, the flowers being monœcious in each simple spike and immersed in pits of the rachis, in threes or rarely more, there being one pistillate between two staminate, bractlets minute, spathes two and of which one persists at the base and the apical one deciduous. The species became *Calyptrogyne spicigera* and *C. Ghiesbrechtiana*, the former name now displaced by lifting *glauca* from the *Geonoma glauca* of Oersted. The name Calyptrogyne is a Greek compound alluding to the covered or hooded pistils. The genus has now been extended by Burret to comprise ten species, continental from Mexico to Brazil and Peru and one from the Greater Antilles, most of them (or the names) being newly made in his paper in 1930.

In 1864 Grisebach founded the genus Calyptronoma to designate the Jamaican species, which he called *Calyptronoma Swartzii*, the plant being "much distinguished" from Calyptrogyne by habit and by characters of flowers, although he did not define the characters. The word Calyptronoma is not explained; it is assumed that it refers to the closed or hooded mouth of the floral pit. Later, however (Cat. Plant. Cub.), Grisebach included his genus in Geonoma.

87. COMPLETE PLANT OF *Calyptrogyne Ghiesbrechtiana*, to show the single erect spike (and a new leaf arising at the right). For comparison with Fig. 86.

In 1901 O. F. Cook established the genus Cocops with a single species, *Cocops rivalis*, to denominate a palm he found in a valley near San Sebastián in Puerto Rico "within a few feet of a small permanent brook" but of which flowers or fruits were not in evidence. The palm appeared to be new, and it was thought that in-

stead of listing it without name "under the present circumstances the application of a name is justified by convenience of reference and that this will also assist in securing the attention of botanical collectors," a hope apparently fulfilled. Until Cook's writing, this Puerto Rican palm has not received a botanical name.

The name Cocops apparently suggests the general resemblance to *Cocos nucifera* in foliage when trunks and inflorescence are not in evidence, a similarity I have noted. These palms are not of the Cocoineæ or Cocos tribe, however, but belong with the Areceæ as defined by Hooker.

Calyptrogyne was a segregate, as we have observed, from the indefinite Geonoma. Grisebach subsequently referred his *Calyptronoma Swartzii* to Geonoma. It is not permissible now to refer these manac palms to Geonoma, after this genus has been so carefully limited by Burret, with diagnoses of more than 170 species, and treatment of related genera (Engl. Bot. Jahrb. lxiii).

The writer has now collected this manac group in Cuba where it is known as "manaca," in Jamaica where called "long thatch," also in Hispaniola and Puerto Rico, and has had access to specimens in other herbaria and has received material from correspondents. Fortunately, mature fruits in good quantity are in the author's collections from the four islands, and these parts at once disclose differences that had long been suspected by him in habits, habitats and "looks" of the plants.

It is to be noted that Wendland based his genus Calyptrogyne on continental palms. The Antillean occurrences he referred to Calyptronoma: note his extensive palm list in Oswald de Kerchove de Denterghem's Les Palmiers, 1878. The two genera, together with Pholidostachys, were merged by J. D. Hooker in Bentham & Hooker's Genera Plantarum, 1883, the accepted name being Calyptrogyne. Drude, however, in 1889, kept Calytronoma separate, in Die Pflanzenfamilien, but included in it both Antillean and continental species, four in all resulting from the combination with it of Pholidostachys. More recently, De Dalla Torre and Harms retain it in Genera Siphonogamarum, as does Von Post in Kuntze's Lexicon in 1904. In his recent monograph in Engler's Botanische Jahrbücher, 1930, Burret unites the two genera; his species are eleven, all continental except *Calyptrogyne occidentalis;* he retains Pholidostachys as a distinct genus.

The merging of Calyptrogyne and Calyptronoma apparently results from inadequate material in the herbaria and insufficient acquaintance with the plants in the field. The two groups have not been well differentiated; nor is it necessary to make complete generic diagnoses here but only to state important contrasts for purposes of a key. All of them agree in being monœcious, the unisexual flowers sunken in pits in the rachis or rachilla, the pattern being two staminates with one pistillate between but

this disposition variable, floral parts six in two series and chartaceous, stamens six and connate, pistil single and structurally three-carpelled but only one carpel may develop in the small fruit.

CALYPTROGYNE. Geonomoid sylvestral palms of small stature, often arundinaceous, sometimes without evident trunk and few if any of them really tree-like, leaves lobed or if pinnatisect mostly not regular in size and placement of parts nor with uniform pinnæform divisions, spadix simple slender and cylindrical terminating a long scape-like peduncle and attended by a narrow caducous bract or spathe or if branched then only with one or two ascending spikes at base and without a continuing central axis or rachis, flowers unisexual with some of the lower ones on the spike pistillate, all more or less immersed in the rachis, style joining three carpels, fruit small with seed-shell or mesocarp bearing only thin fibers and a sparse flesh. (Genus not further discussed in this paper).

CALYPTRONOMA. Arboreous heavy paludine and riparial palms bearing long and large uniformly pinnate leaves, spadix large and axillary under the crown and branched once or twice from a stout central axis, staminate and pistillate normally immersed in the same cavity anywhere on the axis, stamens connate by their filaments into a tube, style central and fruit

88. SPATHES IN CALYPTRONOMA. *a*, the narrow papery primary or permanent spathelet of *Calyptronoma Swartzii*, peduncle projecting, cross-section at upper left indicating its flattened form; *b*, two spathes of *C. dulcis*, at left a young one with secondary or temporary spathelet in center, at right the secondary one still in place but burst by the spadix. One-third natural size.

89. SPATHES IN CALYPTRONOMA, showing the flat thin-edged primary spathelet in *C. quisqueyana* at *c* and of *C. rivalis* at *d*. Collars on peduncle are seen at *2*, the part *e* being extension of peduncle which is rounded or thick as indicated in the cross-section. One-third natural size.

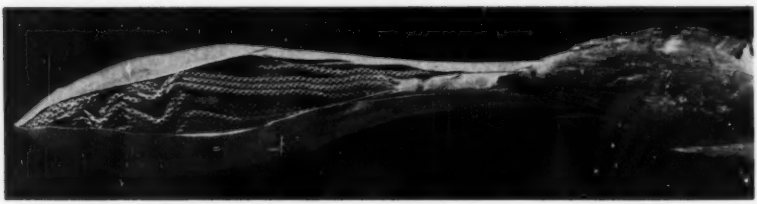
one-seeded with embryo and micropyle at base, the pistil enveloped in an elongated practically closed cone or hood, seed-shell hard or firm and marked with stout interlocking fibers or ribs, the seed often adhering to it.

If these somewhat technical accounts do not suggest the strong contrasts between these two classes of palms, then two pictures will bring them out at once. Fig. 87 is the picture of a complete fruiting plant of *Calyptrogyne Ghiesbrechtiana* in Kerchove's Les Palmiers (under the name *Geonoma Verschaffelti*); note the single slender simple spike coming up from near the base of the plant and erect above the crown (the part at the right is only another upright leaf beginning to unfold), and that the plant has no true trunk. With this contrast the manac of Hispaniola, Fig. 86, now for the first time figured as far as I know: note the arboreous nature, the thick leaf-shedding trunk, the crown of long truly pinnate leaves, and the several heavy branched swab-like clusters hanging underneath the

crown on their stout peduncles. The heavy shed of old leaves and clusters makes conspicuous debris on the ground.

The essential details are visualized in the pictures. The spathes are seen in Figs. 88, 89, 90. At *b* left in Fig. 88 is shown a complete spathe not yet expanded; the primary or permanent spathelet, in two parts or valves, is at the bottom; the secondary or caducous spathelet is above it, housing the rachillæ or floral branches; at *b* right the secondary spathe is arrived at maturity and is split by expansion of the spadix. In Fig. 89 the dry primary spathes are shown, with peduncle of the spadix protruding. Entire inflorescence is seen in Fig. 90, the inner or secondary spathe being burst by the expanding spadix; and the fully developed head of spadix, with the many rachillæ or branches, is in Fig. 91. In Fig. 92 are dried old rachillæ of the different species, showing the pits in which the flowers were borne and the projecting lip beneath each one. The details are in Fig. 93. At the left, A, is a piece of rachilla with the empty pits and a single fruit in place; at B the flowers are emerging from the pits. The part C is a longitudinal section exposing the sunken pits or sulci in sidewise view. At D are three staminate flowers removed from the pits, at top left yet in bud, at top right another view, and at bottom the stamens beginning to show. At E right the stamens are displayed by removal of two front envelopes, all six of them joined into a tube; at E left the stamens and a single anther are removed. At FG is shown the pistillate flower: F, the unexpanded flower, the cone in the center, followed by three sepals separately; G, the central corolla-cone, then the perigynium-like structure inside it which breaks at near its middle and discloses the pistil. In Fig. 94 are the "fruits," that is, the shells or hardened mesocarp after removal of epidermis; a single seed is inside each shell or case. One may also compare the fresh fruits in Figs. 96 and 100.

When one considers the prevailing method of collecting botanical material of palms, without adequate specimens or good photographs and lack of satisfactory notes, one will not be surprised at the scant knowledge



90. COMPLETE SPATHE of *Calyptronoma rivalis*, at early anthesis. The inner spathe is splitting, disclosing the rachillæ or flowering strands. The two-valved permanent woody spathe is at the right. About one-eighth natural size.

of the manacs. The leaves are large and intractable and the inflorescences too awkward and cumbersome to make museum material when we are restricted by the herbarium sheet. Moreover, the leaves are singularly alike in all of them, and mere fragments of foliage are usually picked for specimens. Perhaps we have a comparable case in the Roystoneas, in which detached pinnæ do not show the differences, yet we are now convinced that in the Biseriate group are five or six species.

In Calyptronoma the floral characters appear to be particularly obscure, and the travelling collector does not often find the tree in both flower and fruit. The fruits are small, however, and are easily collected if one learns to distinguish empty unfertilized shells from others of similar size that are solid with seed. I have not seen sufficient really mature fruit in the large herbaria to provide a good comparison of the species and therefore must depend on my own material. Spathes are seldom taken. Yet all these parts can be manipulated readily in boxes made to slip into herbarium pigeon-holes.

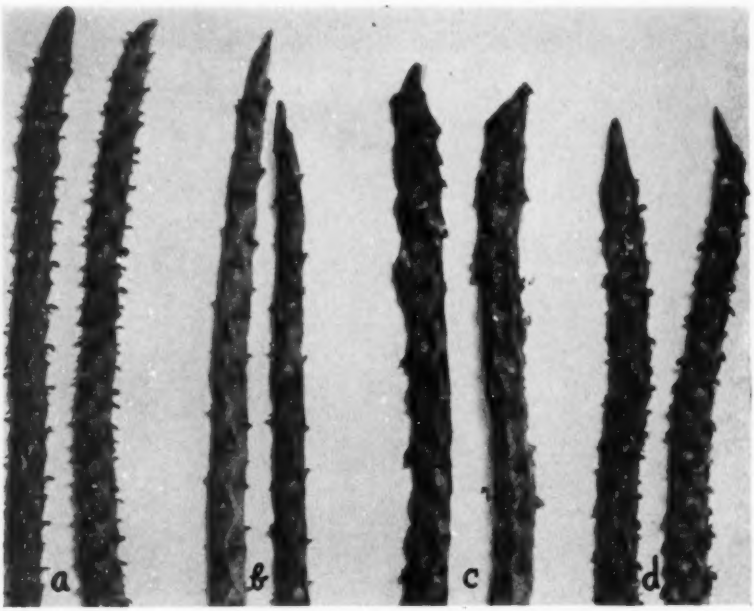
Beccari, in his Palms Indigenous to Cuba (Pomona Coll. Journ. Econ. Bot. ii, Dec. 1912), was not able to find important differences in these palms from the different islands. His lack of material is indicated by the remark that of the Jamaican kind he knew only very immature

91. FULL-LENGTH PROTRUDED SPADIX of *Calyptronoma rivalis*, the inner spathe having fallen. Permanent spathe at right, the upper valve being spilt. Note the large bract on the peduncle in the mouth of the valves. About one-eighth natural size.

fruits which, however, were 12-14 mm. in length,—one of the very points on which I now undertake to separate the manacs on the four big islands.

The nomenclature of the manacs is strangely confused. We have supposed the one definite starting point to be the *Elais occidentalis* of Swartz but this, as we have learned, now fails us. Grisebach recognized the Swartzian diagnosis by calling the plant in Jamaica *Calyptronoma Swartzii*, custom of a former day but not now allowed under the Rules when the names represent the same plant; but the *Swartzii* of Grisebach is probably a very different plant from the *occidentalis* of Swartz and it must hold for the Jamaican palm.

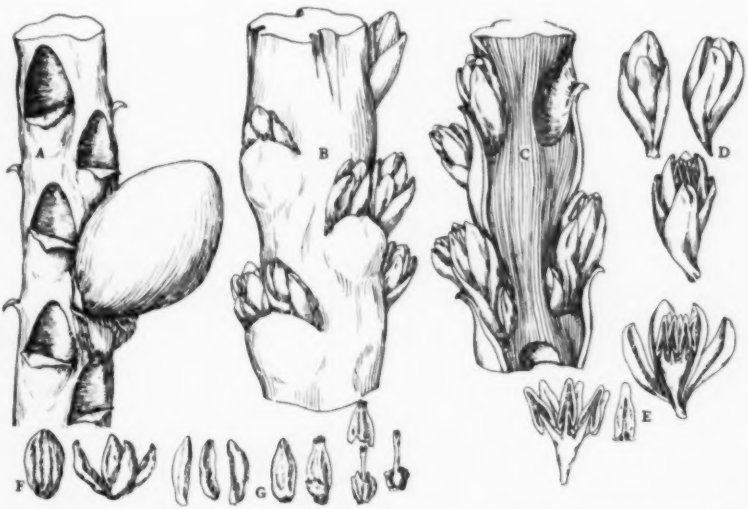
The Swartzian name was transferred in Cuba in 1893 as *Calyptrogyne occidentalis* by Dr. Manual Gómez de la Maza y Jimenez. This author cites *Elais occidentalis* of Swartz as a synonym and thereby establishes the binomial *Calyptrogyne occidentalis*, although he did not state the place of Swartz's publication, an omission we do not now encourage. Under the Rules a name should designate the plant for which it was intended, and



92. RACHILLÆ OF THE FOUR ANTILLEAN MANACS in the dry state, natural size. *a*, *Calyptronoma Swartzii*: *b*, *C. dulcis*: *c*, *C. quisqueyana*; *d*, *C. rivalis*.

this disqualifies *occidentalis* for the Cuban species, even if we disregard the uncertainty of the Swartzian account.

Maza also made *Calyptrogyne intermedia* by citing *Geonoma intermedia* of Griesebach and Wendland, but as the Geonoma binomial was not published so the bare combination under Calyptrogyne is also a *nomen nudum*. He makes *Calyptrogyne dulcis* by citing *Geonoma dulcis* of Wright, and as this latter binomial was published by Grisebach in 1866 it may stand for the Cuban plant now that *occidentalis* is disqualified. Grisebach's *Geonoma* (*Calyptronoma*) *dulcis* Wr. (Cat. Plant. Cub. 222) does not constitute publication under Calyptronoma inasmuch as the genus of his choice was Geonoma and the parenthetic inclusion of Calyptronoma indicates the genus he had then subjugated; nor does the indexical citation (attributed to Wright) in Dahlgren's Index of American Palms, page 82, validate it for either the Jamaican or Cuban species, particularly as the genus is not accepted and the binomial is only a synonym. The incidental mention of *C. dulcis* by Trail in Journal of Botany in 1876, 331, without synonymy or description, does not establish the binomial.



93. Floral parts in *Calyptronoma dulcis*. A, piece of rachilla showing the pits from which flowers have fallen and a fruit; B, flowers emerging into bloom; C, longitudinal section to display the flowers in their pits or sulci; D, three staminate flowers not yet open, the lowest showing stamens; E, staminate flower open, two front petals removed, and at left the stamens (and an anther) united by their filaments; F, pistillate flower, in the center a corolla-cone, the 3 sepals shown separately; and at G the central cone inside which is a tulular toothed calyptra that is circumscissile and contains a single 3-lobed style.

The names employed by Gómez de la Maza are all of Cuban palms. There is supposition that two and perhaps more species of the genus exist in Cuba, but my excursions and the specimens I possess and have seen do not allow me to recognize more than one. If there are others they must be proved by new and abundant collections.

We may pause to note the literary labors of Dr. Gómez de la Maza, who died January 26, 1916. He was professor of botany in the University of Havana. He published various lists of Cuban plants, in Havana, as Diccionario Botanica, 1889; Ensayo de Farmatofitologia Cubana, 1889; Catalogo de las Periantados Cubanos, 1890; Nociones de Botanica Sistematica, 1893; Florula Fanerogamica del Jardin Botanico y del Vedado, 1895; Flora Habanera, 1897; and collaborated with Juan Thomas Roig y Mesa in preparation of Flora de Cuba, 1914.

We are now ready for the monography of the manacs.

CALYPTRONOMA, Grisebach, Fl. Brit. W. Ind. 518 (1864). MANAC PALMS.

Calyptrogyne, Auth., not Wendl.

Cocops, O. F. Cook, in Bull. Torr. Bot. Club, xxviii, 568 (1901).

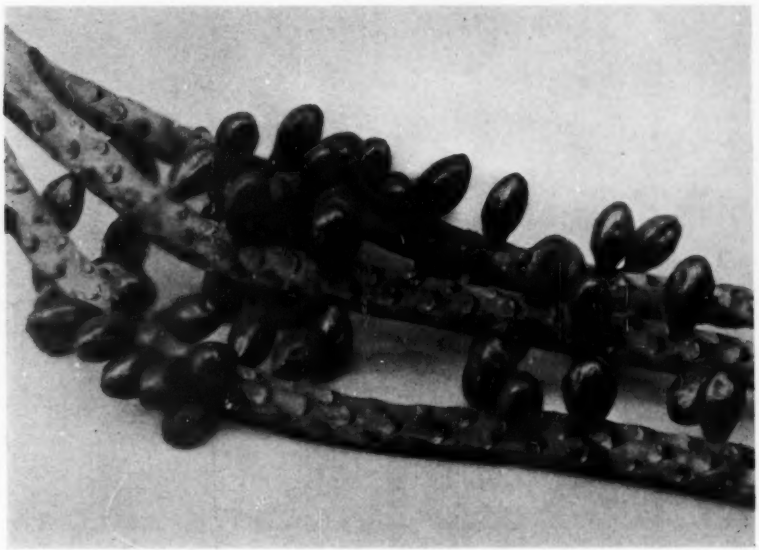
Medium-sized heavy monœcious palms with single stout erect more or less annulate trunk (not soboliferous or arundinaceous) that bears a heavy crown of long uniformly pinnate arching leaves and heavy infrafoliar spadices from old axils: spathe double, the outer or main permanent one flat and 2-valved, chartaceous or woody, the inner a 1- or 2-valved papery sheath that splits with expansion of the spadix and later falls and may not be seen in museum collections: peduncle of spadix usually at length much prolonged beyond the outer spathe, stout, mostly bearing a few small separate bracts towards the upper end and in some species a paper-like collar either within the main spathe or toward the inflorescence; floriferous part of spadix much exserted, a continuous stout axis 1-3 dm. long from which arise many quill-like stiff pointed branches or rachillæ 3 dm. or less long all simple or perhaps the lowest ones 2- or 3-branched: flowers small, imbedded in pits in the more or less fleshy rachis, typically 2 staminates and a pistillate between, the sulcus or pit provided with a lid attached on lower side of opening and which forms a labium; staminate flower papery or chaffy, reddish-brown, sepals 3 of which 2 or all are strongly keeled, imbricate, petals 3 and united by margins into a tube or

94. FRUIT SHELLS (MESOCARP) OF THE ANTILLEAN MANACS, about twice natural size. 1, *Calyptronoma Swartzii*; 2, *C. dulcis*; 3, 4, *C. quisqueyana*; 5, *C. rivalis*.

95. THE JAMAICAN MANAC, trunk deep in water in the Black River region of St. Elizabeth. *Calyptronoma Swartzii*.

cone containing the stamens, the entire blossom when removed from sulcus or alveole 5 or 6 mm. long but becoming 8 or 9 mm. long when anthers are expanded; stamens 6 (sometimes fewer) united by base of filaments into a tube or cup, the sagittate large anthers attached near the lobed base; pistillate flower smaller and closed, the 3 imbricate sepals loose but 3 petals combined into a tube or cone inside which is an apically toothed irregularly circumscissile calyptra (probably staminodal) that incloses the 3-lobed style or sometimes 3 styles, only one carpel maturing: fruit an oblong or oval-pyriform single-seeded body 5-17 mm. long with base well imbedded in its cavity and remains of style showing at basal end, barely fleshy at maturity, glabrous, indefinite in color but in dull shades of yellow or brown, the exocarp when dry readily removable from the firm shell-like irregularly fibered mesocarp or case that carries a rather definite pattern of strands (Fig. 94); seed small, compressed, often adherent to its shell, brownish, with hard uniform white albumen, micropyle and embryo directly at the narrowed base.

Species of Calyptronoma are not restricted to the Greater Antilles, although we do not know the full range. They occur in South America, and we may list such as are known, to add completeness to this paper.



96. RACHILLÆ AND FRUITS of *Calyptronoma Swartzii*, fresh from the tree, but seeds not yet ripe. About natural size.

97. THE CUBAN MANAC in characteristic form in the Trinidad Mountains, Santa Clara Province. *Calyptronoma dulcis.*

In 1876 Trail described **Calyptronoma robusta** in his account of Palms of the Valley of the Amazon (Journ. Bot. xiv, 330, 331) being the only species thus far acknowledged from that continent. In doing so, Trail made significant remarks on some of the characters of Calyptronoma:

"I have referred this species to the genus *Calyptronoma*, Gries. (though doubtfully, owing to the want of flowers), on account of the great resemblance that the spadix bears to the spadices of *Calyptronoma Swartzii*, Gr., and of *C. dulcis* in the Kew Herbarium, as well as on account of the fibres that occur in the mesocarp, in

which respect the fruits agree with fruits of *C. dulcis* at Kew. I have never seen similar fibres in the fruits of any true *Geonoma*."

In Burret's treatment this species becomes *Calyptrogyne robusta*.

† **Calyptronoma Kalbreyeri,** trans. nov.
Calyptrogyne Kalbreyeri, Burret, in Engl. Bot. Jahrb. lxiii, 137 (1930).
Colombia.

† **Calyptronoma synanthera,** trans. nov.
Geonoma synanthera, Martius, Hist. Nat. Palm. ii, 13, t. 13 (1823).
Calyptrogyne synanthera, Burret, l. c. 137.
Peru.

† **Calyptronoma Weberbaueri,** trans. nov.
Calyptrogyne Weberbaueri, Burret, l. c. 139.
Peru.

With these removals, Calyptrogyne remains with six species ranging from southern Mexico to Costa Rica. Calyptronoma has a rather unusual distribution in the Greater Antilles and on the continent in Colombia, Amazon Valley of Brazil, and Peru; we need further studies of the South American species. We have a comparable case of disconnected distribution in Aiphanes, discussed in the second part of this Fascicle (Article 8).

Only twice have I seen a manac palm in cultivation. One was in the Promenade Garden, Georgetown, British Guiana, where a tree in fruiting condition was growing in 1921; it was apparently the Jamaican species. The other is in one of the botanic gardens in Havana.

Key to the Antillean manacs or Calyptronomas.

A. The big-fruited manac: dry mature entire fruit 12-17 mm. long (although variable), laterally somewhat compressed, the largest transverse diameter about 10 mm., prominently wrinkled; seed 9-11 mm. long and 6 mm. or more thick, free from its envelope or mesocarp: rachillæ very densely flowered, the sulci standing 4 or 5 mm. asunder on any continuous face, the lip prominently divaricate and about as long as the cavity: peduncle (of spadix) with or without collar but bearing scale-like bracts toward apex and strongly compressed sidewise when dry; primary spathe relatively small and chartaceous, about 40 cm. or less long and 4 or 6 cm. broad when dried: pinnæ dull green, the leaf-rachis distinctly ridged and grooved throughout its length on the under side (or toward the base strongly convex).—Jamaica ..... 1. *C. Swartzii*

AA. The middle-fruited manac: dry mature fruit 8-10 mm. long and 6-7 mm. thick, not evidently laterally compressed, wrinkled; seed about 7 mm. long and 5 mm. or less thick, attached to its envelope: rachillæ relatively open-flowered, the sulci about twice as far apart on any face as in A, lip not as long as cavity and the axis therefore smoother-looking: peduncle lacking a collar but perhaps bearing small separated bracts; primary spathe much as in A: pinnæ mostly glossy on upper face when mature, the rachis flat or essentially so on the upper side (or only mildly convex toward base).—Cuba ..... 2. *C. dulcis*

AAA. The small-fruited manacs: fruit 5 or 6 mm. high when mature and dry, not noticeably wrinkled or inflated, balloon-shaped, looking very small and inconsequent; seed adherent to its envelope or case: peduncle bearing collar but bracts few or none, stout, nearly terete or at least its thickness three-fourths the greatest diameter; primary spathe woody when dry and 10-12 cm. broad and margined.

B. Fruit at maturity not taking the floral parts (calyx or corolla) with it when it falls; seed-case (mesocarp, inside the papery exocarp or external covering) marked on one side with a few strong parallel lines reaching nearly to its top: rachillæ relatively open-flowered and showing irregular longitudinal ridges, as if angled, when thoroughly dried.—Hispaniola ..... 3. *C. quisqueyana*

BB. Fruit for the most part carrying the dry floral parts when despatched, as conspicuous basal flaring points; seed-case with oblique (not uniform parallel) lines on one face or on both faces: rachillæ closely and contiguously flowered, terete and not ridged when dry.—Puerto Rico ..... 4. *C. rivalis*

1. **Calyptronoma Swartzii,** Grisebach, Fl. Brit. W. Ind. 518 (1864), excl. syn. JAMAICAN MANAC. LONG THATCH. Figs. 88, 92, 94, 95, 96.

Geonoma Swartzii, Grisebach & Wendl. Cat. Plant. Cub. 222 (1866).

Tree to 12 m. tall, the trunk medium stout and roughly annular and 2 dm. or more in diameter at or near base, the head of foliage rather thin and composed of 20 or fewer dark but bright green spreading or arching leaves that are 2.5-3 m. long at maturity with many hanging pinnæ: petiole 2-8 dm. long, trough-like at base, concave above and with a central low ridge but becoming rounded in its main rachial course: pinnæ 30 or more pairs, those at middle 6 dm. or more long and 4-5 cm. broad, glabrous except perhaps the midrib furfuraceous underneath, the strong rib paralleled on either side by two prominent veins and lesser ones between, the tips long-narrow and usually split: spadix ½ to nearly 1 m. long, axillary underneath the crown, nearly horizontal and then declining, and finally hanging as a dead object; flattened peduncle exserted beyond primary spathe, the latter 4-6 cm. broad and sharp-edged only on one side; head of spadix 4 dm. or more broad when expanded; rachillæ 2-3 dm. long, 2-4 on a very short foot or peduncle, densely flowered, the pits 4 or 5 mm. apart, lip spreading and about equalling its cavity: fruit 12 or 13 to 17 mm. long and 10 mm. or less broad, somewhat compressed and 2-edged; mesocarp or envelope strongly margined and ribbed (1 in Fig. 94); seed 11 mm. or less long, free from the envelope.

Known to me mostly as a morass palm near the sea in Jamaica, making continuous and often dense stands. I have taken what I consider to be the same species in moist rocky woods at considerable elevations, not at fruiting age. Britton's notes attribute it to "marshes and moist woods and hillsides, from sea-level to 700 meters." A frequent gregarious palm.

Type locality: apparently taken by Grisebach from Swartz, "in the lower region of the interior hills" in Jamaica, but main description original.

† 2. **Calyptronoma dulcis,** trans. nov. MANACA. CUBAN MANAC. Figs. 88, 92, 93, 94, 97, 98.

Geonoma dulcis, Wright, ex Grisebach, Cat. Plant. Cub. 222 (1866).

Calyptrogyne occidentalis, Maza, Dicc. Bot. 81 (1889) and Noc. Bot. Sist. 50 (1893) as to citation.

Calyptrogyne Swartzii, Becc. in Palms Indigenous to Cuba, 356 (Pomona Coll. Journ. Econ. Bot. iii, 1913).

Tree to 7 m. tall, rather slender, coarsely ringed, bearing a spreading head of many long pinnate leaves that extend widely and the lower ones declined: pinnæ rather rigid, usually glossy on upper surface at maturity and lighter colored underneath, prominent midrib underneath brown-scaly or furfuraceous and accompanied either side by 2 or more pairs of parallel ribs, rather narrow (3-4 cm. broad) and not very long (usually 6-7 dm.), the points not excessively attenuate: spadix 7 dm.-1 m. long, eventually hanging, the terete rachillæ rather loosely flowered (the dry lips to the sulci on a continuous face often 6-8 mm. apart), the lip not closing the cavity or sulcus; peduncle somewhat compressed and perhaps bracted but without collar; primary or permanent spathe 4-6 cm. wide, papery, 2-edged, to 4 dm. long: dry fruit 8-10 mm. long when full grown and 6-7 mm. thick, little if at all flattened, wrinkled; seed about 7 mm. long and 5 mm. thick, attached to its covering or envelope.

98. THE TWO SPATHES, each with two separable parts or valves, one-third natural size, of *Calyptronoma dulcis*, taken in western Cuba at early stage of florescence. The peduncle emerges midway on the left; total length was 20 inches, distinctly flattened, with bracts but no collar; the head or floral spadix was 14 inches long and about the same breadth and bore 133 branches or rachillæ.

Banks of streams, wet woods, about marshes, often in moist ravines in mountains, well distributed in Cuba, as in Pinar del Rio, Habana, Santa Clara, Oriente; Isle of Pines.

Type locality, Province of Habana, western Cuba, *Wright no.* 1865.

It is a characteristic tree of arroyos and mountain streams in lower and middle altitudes. In Cuba it has been said, "Donde hay manaca hay agua y buena," which being translated means that where one finds manaca one also finds water that is good. The word *dulcis* (sweet) refers to the edible flowers, used in comfits.

† 3. **Calyptronoma quisqueyana,** spec nov. HISPANIOLAN or QUISQUEYAN MANAC. Figs. 86, 89, 92, 94.

Magna arbor valida ad 10 m. alta; truncus 3-4 dm. in diam. crasse annulatus: frondes pinnatæ, 3 m. vel longæ; pinnæ ad 1 m. longæ 7 vel 8 mm. latæ, valde costatæ: spadix matura ad 1 m. longa, pedunculus annulatus; spatha prima 8-12 cm. lata, anceps; rachillæ aperte floreatæ, costatæ in longitudine cum siccæ: fructus 5-6 mm. longus, partes florales caducæ, mesocarpium paucis validis lineis parallelis in uno latere; semen pericarpio aptum.

Stout stocky tree to 10 m. tall, trunk closely ringed, 3-4 dm. in diameter above base, supporting a broad heavy head of leaves 3 m. or more long: pinnæ to 7 or 8 mm. broad, dull above and lighter green underneath, to 1 m. long, ribbed and grooved, glabrous or midrib underneath somewhat scaly and not much more prominent than the several lateral ribs, long-attenuate, the rachis strongly angled in section and ridged in center above: spadix large and heavy, at first lying in the trough on the upper side of the great petiole, this trough 6 dm. to 1 m. long and sharp-edged and 2 dm. across at base, spadices soon declined but held on trunk by expanded bases after the leaves fall; peduncle 6 dm. long, stout and mostly nearly terete, bracts few or none but collar evident; rachillæ rather loosely flowered, drying into angled strands; permanent or primary spathe woody or very stiff, to 8-10 or 12 cm. broad and 2-edged: fruit small, about 5 or 6 mm. long when ripe and mature, parallel-ribbed nearly to top on one side, the dry floral envelopes usually not adherent to it when it falls; seed adherent in its case.

Hispaniola (Quisqueya of the aborigines), along streams and in wet places in mountains in both Haiti and Santo Domingo; apparently local.

Type locality, Morne Saut d'Eau, Chaine des Matheux, Ouest, Haiti, *Bailey 229, 229a,* beyond and above Ville Bonheur in threads of a mountain stream.

It has been supposed this is the palm intended in *Geonoma? Plumeriana,* Martius (Palmetum Orbignianum, 34, 1847); but neither the diagnosis in Martius, taken from Plumier, nor the published picture in Plumier's Nova Plantarum Americanarum Genera, 1703, represents the present

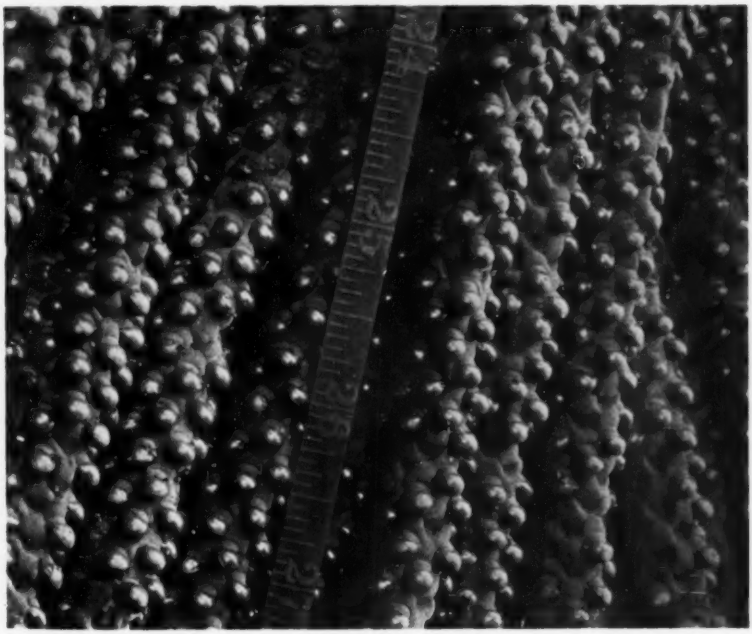
99. THE PUERTO RICAN MANAC in deep valley between San Sebastián and Lares. *Calyptronoma rivalis*.

species and there appear to be no original specimens in the Martian herbarium: to this problem I hope to return.

† 4. **Calyptronoma rivalis,** trans. nov. PUERTO RICAN MANAC. Figs. 89, 90, 91, 92, 94, 99, 100.

Cocops rivalis, O. F. Cook, in Bull. Torr. Bot. Club, xxviii, 568, t. 47 fig. 2 (1901).

Stout tree to 8 m. tall, the obscurely ringed trunk 2-3 dm. in diameter near base, carrying a heavy head of horizontal side leaves from which the many closely placed pinnæ droop gracefully, a few of the spent leaves finally hanging along the trunk: leaves 2-3 m. long; petiole with expanded ascending base as it stands on the tree, the rachis strongly angled in cross-section and in its lower length ridged in middle above; pinnæ not stiff, 5 cm. more or less broad and 1 m. or more long, dull in color, but lighter underneath, glabrous unless scaly on midrib underneath, the several side ribs prominent, points long-attenuate: spadix usually more than 1 m. long at full extension, the long rounded peduncle with



100. PORTION OF A FRUIT-CLUSTER of *Calyptronoma rivalis,* slightly enlarged; fruits not mature.

99. THE PUERTO RICAN MANAC in deep valley between San Sebastián and Lares. *Calyptronoma rivalis.*

a conspicuous collar and usually without bracts; rachillæ closely flowered, terete and not becoming strongly angled or ridged when dry; primary spathe 6 dm. or less long, 7-8 cm. broad, thick in substance, 2-edged; fruit 5-6 mm. long at maturity, carrying with it when it falls some of the dry dead floral parts like projecting points at its base; seed-case with oblique ridges on one or both faces; seed adherent to its case or envelope.

Puerto Rico, along a deep valley stream near San Sebastián, Aguadilla, in an isolated colony and extending toward Lares, *O. F. Cook, Bailey, C. L. Horn;* the only station known on the island.

ARTICLE 8. NATIVE BACTRIDS OF THE GREATER ANTILLES.

It is interesting to note that each of the four great islands has its own species of bactrid (Bactris and related groups), as we shall now discover. This parallels the case of the manacs.

In 1703 Charles Plumier listed "Palma dactylifera, aculeata, minima" among palms of the West Indies, in his Nova Plantarum Americanarum published in Paris, and left unpublished pictures of it. It was as late as 1847 when a binomial was applied to it, by Von Martius in his Palmetum Orbignianum, *Bactris Plumeriana*. Martius attributed the palm with a question to Martinique and Guadeloupe, citing Plumier who, however, did not specify particular locality. In his subsequent treatment of the tree in Historia Naturalis Palmarum, 1845, Martius assigned it to the French Antilles.

The Cuban and Jamaican bactrids have been referred consecutively to *Bactris Plumeriana* until 1929 when Max Burret published on the palms collected in the West Indies by Ekman: the palm of the former country he named *Bactris cubensis*, having found sufficient points of separation. The Cuban species is more spiny on all parts than the Hispaniolan, trunk spines nearly twice as long (to 10 or 11 cm.), pinnæ spinulose on margins and the apex very unequally bifid, spathe with few branches, fruit smaller and of different shape (depressed-globose).

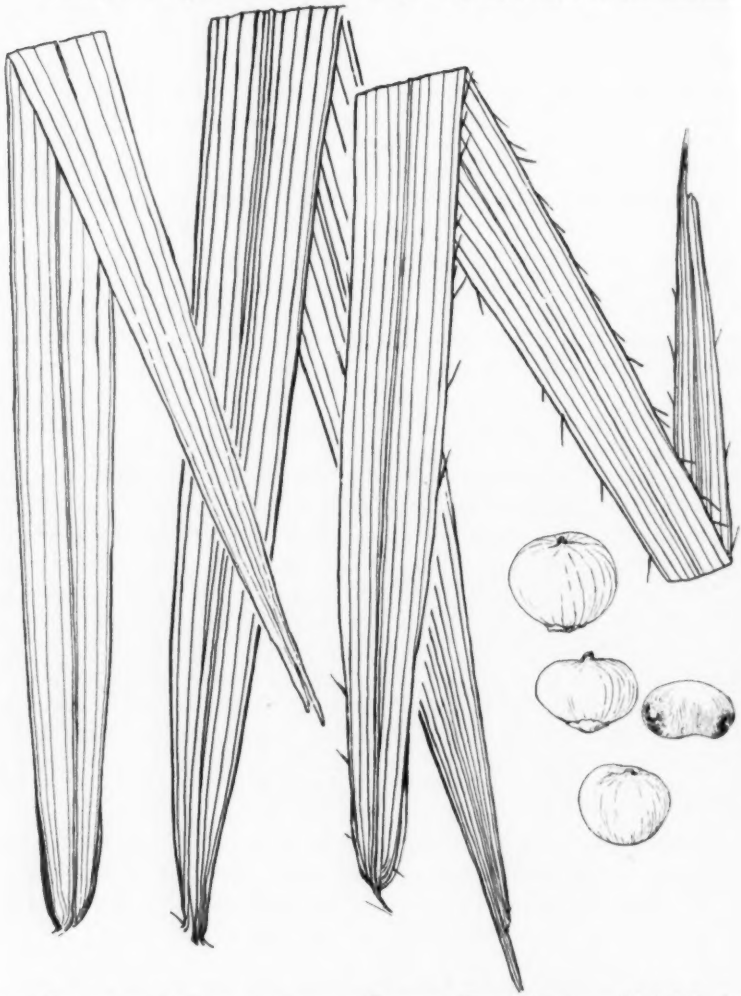
The Haitian palm, *B. Plumeriana*, I have collected at Source Décayette in Haiti and near Bohoa in Santo Domingo on the other part of the island, and I have seen it elsewhere in Hispaniola. It is not known to occur on other islands, if the Jamaican occurrence is disregarded. The Cuban species I have taken far in the Sierra Maestra, Oriente Province. Burret figures *B. Plumeriana* in his Ekman paper, from the pictures left by Plumier.

The leaf specimens I have taken in Santo Domingo are much more spiniferous than those I happen to have seen in Haiti, but I suppose the two are the same species. The spinose character depends much on the age of the leaf or plant. Very likely my Santo Domingan material is the *Bactris? chætophylla* of Martius which he made on leaf specimens from that country and which has not been identified: see Burret's Ekman palms p. 25 (in Kungl. Svenska Vet. Handl. vi).

In 1725 Hans Sloane described the Prickly-Pole, in his Voyage to the Islands Madera, Barbadoes, Nieves, St Christophers, and Jamaica (Natural

History), saying it grew very plentifully in thickets near the Moneque Savanna, and in several other places in Jamaica (p. 121). The description is so pictorial that I copy it:

"Thirty or forty of these grow always together, close to one another,



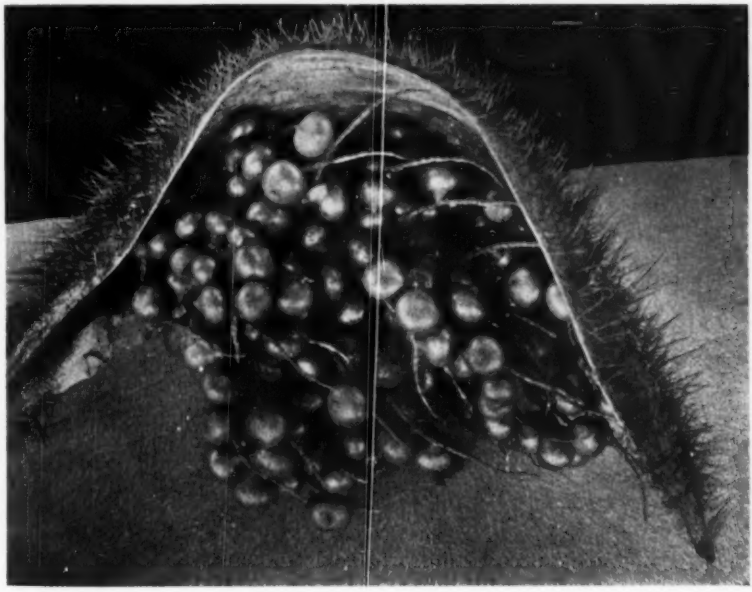
101. THE THREE ANTILLEAN SPECIES OF BACTRIS. Pinnæ about one-third full size: left and right, the relatively narrow pinnæ of *Bactris Plumeriana* and *B. cubensis*, showing spiny character of the latter; middle, the broader more strongly ribbed *B. jamaicana*. Fruits approximately natural size: top, *B. Plumeriana;* middle two, *B. jamaicana;* lowest one, *B. cubensis*.

they have, at coming out of the Ground, a Swelling, as most Palms, made up of many Thongs or Ligulæ interwoven or matted together; the Stem is very small, being but four or five Inches over; 'tis forty Foot high, of a clay or grey Colour, and very thick beset with large and long Prickles round it; the Leaves are all at the Top like the Coconut and the others of this Kind, only greener, not so long, altho' the Pinnæ are longer in Proportion to the whole Leaf, and very thick beset with Prickles, the Fruit stands as the others of this Kind, is bigger than the largest Pea, has a red Skin covering a sweet, thin Pulp which incloses a hard, white Kernel."

"Negro's travelling barefooted thro' the Woods, very carefully avoid Places where these grow, because of the many Prickles that fall from their Stems and Leaves, so that for several Paces in Circumference the Ground is full of them."

In 1756 Patrick Browne mentions "The Prickly Pole," in his Natural History of Jamaica and I quote as follows from Ehret's edition of 1789:

"This slender tree is very common in the inland woods of Jamaica, and supplies the wild hogs with abundance of food, when its berries are in season. It is seldom above four inches and a half in diameter, tho' it generally rises to the height of twelve or fifteen feet: but both the leaves and flowers are disposed like those of the cabbage tree. The outward part

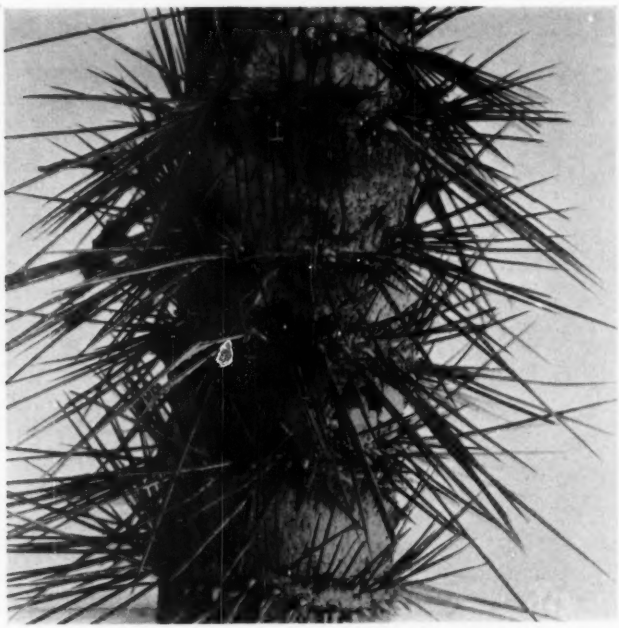


102. FRUIT-CLUSTER AND SPATHE of *Bactris jamaicana*. About one-half full size.

of the trunk is extremely hard and elastic, and looks much like whalebone; it is very fit for bows and rammers."

In 1811 Titford described a "Prickly Pole" with the name *Cocos Guineensis*, a binomial made by Linnæus for another palm; this entry occurs in Sketches towards a Hortus Botanicus Americanus, which deals largely with Jamaican plants.

Prickly-pole palm is in Jamaican records from those old days until the present, and I have seen specimens of it from a number of places. Its Latin binomial is always stated as *Bactris Plumeriana*. At present it seems to be little known, and I have vainly looked for it in many places on trips to the island. It is destroyed by fire and I am told it is cut down because of its vicious prickles, and it is now to be expected mostly in remote areas unless special clumps have been left. When searching for it in August 1931 it was spied as a great group among broad-leaved trees in a pasture near Gibralter, St. Catherine, with dead fruit but spathes intact. I visited the spot again in November 1935 and found the clump in good red fruit; smaller stands of it were seen beyond, over the hill. It is a palm of dry high lands. "Common in the inland woods, Manchester", according to Grisebach. It has good marks of differentiation from both *Bactris Plumeriana* and *B. cubensis*, as we shall now discover.



103. TRUNK ARMATURE of *Bactris Plumeriana*. About three-fourths full size.

† **Bactris jamaicana,** spec. nov. PRICKLY-POLE. Figs. 101, 102, 105.

Palma maxima sobolifera, ad 8 m. alta; truncus durissimus ad 1.5 dm. in diam., cæsio-albus et exfoliatus in superficie cum maturus; spinæ nigræ debilesque 3-6 cm. longæ; folia 12 vel plura in arboribus maturis ad 3 m. longa; petiolus compressus, spinis nigris in inferiore latere quarum breviores 1-2 cm. longæ, longiores, 4-6 cm. longæ; pinnæ 120 vel plures, non aggregatæ, ad 70 cm. longæ, 4 cm. latæ, fere espinosæ; spatha 30 cm. vel plus longa; spadix longior quam spatha, circa 50 ramis: fructus lucide coccineo-aureus, valde oblatus, 15 vel 16 mm. latus, 10 vel 11 mm. longus, glaber, multo minor quam in *B. Plumeriana*, major quam in *B. cubensis*.

Large coarse bactrid, maturing with several or many trunks in a close clump, to 8 m. tall and the hard-shelled trunks to 1 or 1.5 dm. diameter, often buttressed by a great base of matted and superficial roots: trunk developing a gray-white flaky bark, the rather sparse slender needle-like black weak spines 3-6 cm. or more long and both ascending and reflexed, ringed on upper part of trunk: leaves on mature trees clustered at top, dull in color, perhaps a dozen in number, to 3 m. long, blade not flat because of the ascending pinnæ, flattened petiole beset on its nether low-ridged face with thin black spines 1 or 2 cm. long interspersed by others 4-6 cm. long, rachis short-prickly on back but bare on the upper grooved face unless on the edges; pinnæ 60 or more pairs on full-sized leaves although not opposite on the rachis nor clustered, often devoid of prickles, central ones to 70 cm. long and about 4 cm. broad at middle, long-attenuate to a narrow base, long-pointed and with a very unequally divided apex, glabrous, bearing usually 3 strong nerves either side the prominent midrib and lesser nerves between: spadix infrafoliar from a basal flattish soft-spiny sheath about 15 cm. long and an elongated main stiffly and divaricately spiny pointed spathe 30 cm. and more long that commonly exceeds the inflorescence which bears perhaps 50 short

104. TRUNK ARMATURE of *Bactris cubensis*. About one-third natural size.

glabrous branches: fruit bright scarlet-orange at fresh maturity and showy, in a close cluster that may be 15 cm. long, circular in outline but so strongly compressed endwise as to be almost flat top and bottom, to 15 or 16 mm. broad, 10 or 11 mm. high not counting the very short point on top, glabrous, finely longitudinally veined when dry, the flesh or pulp thin and said to be eaten by birds but drying down to a thin skin; seed single, shape and size of the dry fruit, black, curved and not apiculate at top, the 3 pores on the sides large and prominent, albumen white and hard and not ruminate but marked by embryonic cavities.

Widely distributed in Jamaica, although not now common. Type locality, Gibralter in St. Catherine, on Gibralter Road in pasture of Frank Roper estate, *Bailey 216, 714;* a clump of many trunks, about 25 feet high and largest boles 5 inches in diameter; children said to eat the meat in the little nut; birds eat the thin external pulp.

I have seen leaf specimens of the native Bactris from Jamaica with more spiny leaves than those I have described; they were probably taken from young leaves or leaves on immature trees, whereas my diagnosis is drawn from full-grown leaves on bearing trees. The common practice of making specimens from young or immature leaves, because they are easier to collect and to handle, is one reason for the confusion in palm identification.

105. ARMATURE of *Bactris jamaicana*, against the gray-white trunk. About one-half natural size.

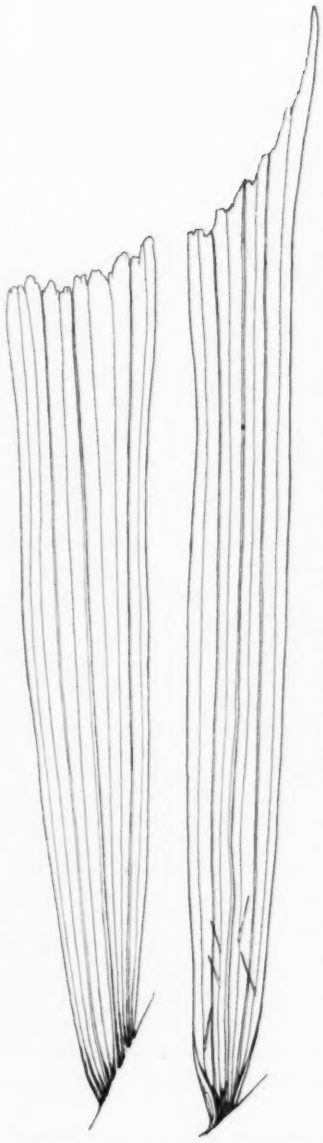
The Hispaniolan species, *Bactris Plumeriana*, distinguishes itself from the Jamaican plant by its more profuse armature (Fig. 103), leaf-blade apparently flatter in expansion of pinnæ and color lighter, pinnæ smaller, relatively broader at base, sometimes sparsely spiniferous, much less prominently nerved or ribbed and apex more evenly bifid, spathe mostly shorter, fruit twice the bulk and not depressed. The Cuban species, *B. cubensis*, is more strongly armed than either of the others (Fig. 104), pinnæ

106. Coyure palm in Puerto Rico. *Aiphanes acanthophylla.*

glossy and shorter than those of the Jamaican and less strongly ribbed and probably more constantly spiniferous on margins, spathe very stoutly armed, spadix mostly with 25 or fewer branches, fruit conspicuously smaller.

We are now ready to consider the bactrid of Puerto Rico. This plant was first given an accredited binomial by Martius in 1847, *Bactris acanthophylla*. It was described by O. F. Cook in 1901 as a new genus, *Curima calophylla*. Beccari in 1920 made it *Martinezia acanthophylla*. Burret in 1932 revived the Willdenovian genus Aiphanes (having taken it out of Martinezia to which authors had referred it) and made the Puerto Rican palm *A. acanthophylla*. He referred to it the *Bactris erosa* of Martius, although under the Rules this name should supplant *acanthophylla* if the two are identifiable and are the same species because of prior page of publication. In fact, however, *B. erosa* is unidentifiable from the leaf diagnosis in Martius and he gives no locality or nativity although the species is based on the work of Plumier. Like Martius' *B. chætophylla* and *B. Pavoniana*, both ascribed to definite islands, his *B. erosa* may well be left out of synonomy as *nomina incerta*. Subsequent exploration has not discovered them. With leaf forms so diverse between foliage on young and mature plants it would not be strange if these specific names belong to recognized species of Bactris or Acrocomia, or possibly to planted palms.

107. TRUNK OF COYURE. *Aiphanes acanthophylla.*



108. TWO PINNÆ from a single leaf of *Aiphanes acanthophylla*. Nearly one-third natural size.

AIPHANES, Willd. in Mém. Acad. Berlin, 1804, 32; Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xi, 557 (1932). See Gent. Herb, iii, 113.

Willdenow established the genus Aiphanes to accommodate a single species, *A. aculeata*, from the Caucagua district in the province of Caracas, Venezuela. He did not explain the generic name. I pronounce the word in four syllables, as if spelled A-if'-an-ees: Willdenow wrote it as for four syllables, Aīphanes.

In 1794 Ruiz and Pavon founded the genus Martinezia in Chile, subsequently proposing several species in Chile and Peru. These species have been assigned to other genera by Burret (in Fedde, Repert. xxiv, 169, 1933). The cis-Andean species named under Martinezia have been separated into three genera by other authors: Marara, Karsten 1856; Curima and Tilmia, Cook 1901. To cover these three genera Burret brings up Aiphanes, and he enlarges this genus to about 30 species of wide distribution from the Greater Antilles to Brazil, Ecuador and Peru. I have not had opportunity myself to study the Aiphanes of Willdenow.

Aiphanes differs greatly from Bactris in its elongated open inflorescence with long lateral branches and the narrow spathe that may not cover the fruit-cluster; pinnæ not always distinct, often conspicuously broadened and perhaps erose and jagged at apex. Its most familiar example is the Colombian species now widely planted: **Aiphanes caryotæfolia,** Wendl. in Kerchove, Les Palmiers, 230 (1878); *Martinezia caryotæfolia*, HBK. Nov. Gen. & Spec. i, 305, t. 699 (1815);

Marara caryotæfolia, Karsten, Fl. Columb., ii, 134, t. 170 (1858); *Tilmia caryotæfolia*, O. F. Cook, in Bull. Torr. Bot. Club, xxviii, 565 (1901).

Exploration has thus far revealed only one Aiphanes native in the Greater Antilles, and it may be displayed as follows:

Aiphanes acanthophylla, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xi, 558 (1932). COYURE. Figs. 106, 107, 108, 109, 110.

Bactris? *acanthophylla*, Martius, in Palmetum Orbignianum, 70 (1847).

Curima calophylla, O. F. Cook, in Bull. Torr. Bot. Club, xxviii, 561, t. 48 (1901).

Martinezia acanthophylla, Becc. in Urban, Symb. Antill. viii, 79 (1920).

Erect robust tree to 16-18 m. tall, the roughly ringed trunk 2 dm. in diameter above base and provided with declined black spines to 7 cm. long but sometimes becoming nearly or quite spineless with age: leaves pinnatisect to pinnate, 1.5 to 2.5 m. long, wide-spreading or the lower ones declined, bearing many sharp black spines 1-3 cm. long on the slender petiole and rachis but upper rachis perhaps bare in leaves on mature trees, rachis convex underneath and ridged above; segments or pinnæ confluent toward apex but separate and not clustered on central and lower part of leaf and 3-6 dm. long, rather thin but many-ribbed, glabrous, green above and lighter colored underneath, upper ones 3-7 cm. broad and the lowest about one-half that width, ends truncate-erose or irregularly notched and some of them produced into a finger on the upper margin: spadix interfoliar, to 1.5 m. long, peduncle thickly black-spined, the continuous axis bearing many lateral simple branches 6-15 cm. long which are staminate on upper part and pistillate at base; spathe about length of spadix, narrow, usually very spiny on outside (at least toward base) and unarmed within; staminate flowers about 3 mm. long, whitish, rather loosely placed on the slightly zigzag rachis: fruits globose, red with thin flesh, the fallen seeds soon becoming bare and bleached (Fig. 110), strongly pitted, with 3 prominent lateral micropyles, about 15 mm. diameter.

Puerto Rico, in moist or wet places in woods and fields, not ascending above central elevations on mountains.

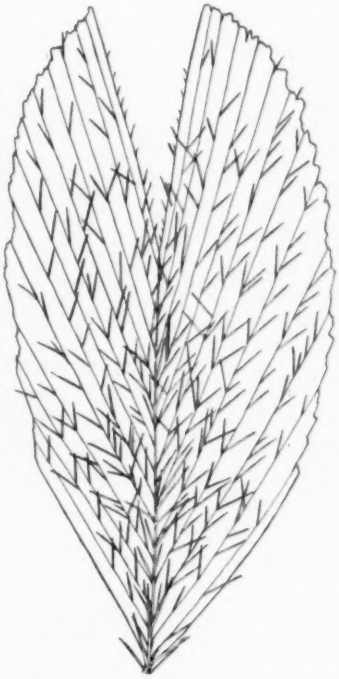
The original diagnoses of *Bactris ęrosa* (which has been referred here) and *B. acanthophylla* were drawn from leaf specimens only, and it is probable the leaves were from young plants and likely to be very different from those of mature trees. The same is true of *Bactris Pavoniana*, Martius, Palmetum Orbignianum 70, collected by Pavon in Puerto Rico. Britton attaches it to *B. acanthophylla* in Botany of Porto Rico, i, 114, but does not pronounce on it. Burret thinks it may be an Acrocomia (Fedde, Repert. xxxiv, 235).

For clarification we may enter the Barbadan species, as follows:

Aiphanes erosa, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, 558 (1932), excl. syn.

I have taken this palm in Turner's Hall Wood (original region) and also in a gulch near Ape's Hill, island of Barbados. It appears not to be positively known on other islands although Burret questions whether sterile material from St. Vincent and Grenada may not be the same. As I saw the palm on Barbados it was a small very spiny tree, 4-6 m. tall, the spines on the trunk nearly terete and 5-6 cm. long and all other spines larger and much stouter than in *A. acanthophylla*, sometimes 8 cm. long, but no spines on the spathe although a few on the peduncle: terminal confluent segments or pinnæ to 8 or 12 cm. broad, nearly truncate and not deeply erose or jagged, the separated pinnæ less prominently side-ribbed than in the other species: fruit red; seed not deeply pitted but roughened, about 10-11 mm. diameter.

There has long been in cultivation a palm known as *Martinezia erosa*,



109. SIMPLE LEAF-BLADE OF A SEEDLING *Aiphanes acanthophylla*, of the kind sometimes taken as a specimen. One-third full size.

110. THE ATTRACTIVE NUTS OF COYURE, natural size. *Aiphanes acanthophylla.*

but whether it is the plant intended by Martius' *B. erosa* is not to be determined. Commercial seeds under this name in my collection are *Aiphanes acanthophylla;* my specimens from a growing plant in Brazil are probably *A. erosa*. In horticultural literature are a number of references to *Martinezia erosa* but not in sufficient detail to establish actual identity. Picture of a juvenile plant has also been printed several times but this does not identify the species.

ARTICLE 9. THE COPERNICIA PUZZLE IN JAMAICA.

In his Flora of the British West Indian Islands published in 1864, A. H. R. Grisebach ascribes *Copernicia tectorum* of Martius to Jamaica (p. 514) where it was said to grow "on all the honeycombed rocks" according to Sloane and "on vertical limestone-rocks" according to Gosse. These habitats suggest a widespread and presumably a common palm, yet to this day a native Copernicia has not been really discovered on the island. The late N. L. Britton made diligent search for it, and I have his note to the effect that there are no specimens to represent it either at Kew or the British Museum. I also have searched for it in many parts of the island and have found no trace although I have been told that a palm of something like this nature exists.

Apparently the solution of the problem lies in discovering Grisebach's reason for admitting Copernicia to the Jamaican flora; and in this quest we are to remember that knowledge of palms of the West Indies at that epoch was only fragmentary, and that the differentiation of species had not become critical.

The Venezuelan palm that Grisebach assigned to Jamaica began in 1815 with Humboldt, Bonpland and Kunth as *Corypha tectorum*. In 1838 it was transferred to Copernicia by Von Martius. If there is a native Copernicia in Jamaica we would not expect it to be the Venezuelan *C. tectorum* but probably an endemic species.

It is clear from Grisebach's discussion in his Flora that he introduced the palm from the account by Sir Hans Sloane in the second volume of his Natural History, 1725, supplemented by the later record by Gosse. The palm is called "Thatch" in Sloane and the description is apparently mixed. Sloane has a picture of the leaf, which does not have a spiny petiole as his description asserts. The leaf is a Thrinax, perhaps *T. tessellata*. Sloane cites John Ray, who published his Historia Plantarum in London in 1686-88.

At this point I applied to the British Museum, Natural History, and find that Sloane's material of the palm is there preserved, the very specimen from which his picture was made; and the petiole is not spiny. Mr. A. H. G. Alston has kindly sent me photographs and notes. Sloane had before him not only the Thrinax leaf but also a piece of "Palma surinamensis," very spiny, probably a bit of a young Bactris. It is from these two specimens as well as the writings of Ray that Sloane made up his account, which by Grisebach was connected with *Copernicia tectorum*.

I conclude, therefore, that whatever may be discovered in Jamaica in the way of Copernicia (and I expect none), the entry in Grisebach may be discarded; *Copernicia tectorum* is to be eliminated from palm lists of the island